## What is claimed is:

1

1

2

3

- A method of digitally canceling interference on a received signal 2 within a satellite payload comprising adaptively canceling interference on the 3 received signal using an interference reference feedforward signal. 4
- 2. A method as in claim 1 further comprising subtracting an counter-1 interference signal from the received signal to form a desired signal. 2
  - 3. A method as in claim 2 further comprising digitally processing said desired signal to generate said feedforward interference reference signal.
- method as in claim 3 further comprising correlating said 1 4. interference reference feedforward signal to said desired signal to generate an error 2 3 signal.
- 5. A method as in claim 4 wherein adaptively canceling interference on 1 2 the received signal further comprising generating said counter-interference signal based on said error signal to cancel said interference.
- 6. A method as in claim 5 wherein adaptively canceling interference . 1 further comprises iteratively canceling interference on the received signal until said 2 error signal equals zero. 3
  - 7. A method as in claim 1 wherein said adaptively canceling 1 interference further comprises digitally and accurately replicating the interference. 2

	\
1	8. A method as in claim 1 further comprising simultaneously digitally
2	canceling interference on a plurality of received signals.
1	9. A method as in claim 1 further comprising sequentially digitally
<b>2</b> .	canceling interference on a plurality of received signals.
1	10. A method of digitally canceling interference on a received signal
2	within a satellite payload comprising:
3	receiving a communication signal having interference;
4	converting said communication signal into the received signal;
5	subtracting a counter-interference signal from the received signal to form a
6	desired signal;
7	digitally processing said desired signal to form an interference reference
8	feedforward signal;
9	correlating said interference reference feedforward signal to said desired
10	signal to generate an error signal; and
11	adaptively canceling interference on the received signal based on said error
12	signal by generating said counter-interference signal to cancel said interference.
1	A satellite communication system comprising:
2	a first antenna for receiving a communication signal;
3	an analog-to-digital converter (ADC) electrically coupled to said first

antenna, said ADC converting said communication signal to a received signal;

8	form an interference reference feedforward signal; and
9	a feedforward signal path electrically coupling said output to said second
10	input, said feedforward signal path transferring said interference reference
, 11	feedforward signal from said output to said second input.
	12. A system as in claim 11 wherein said satellite payload circuit further comprises:
100 miles 100 mi	a subtractor electrically coupled to said ADC, said subtractor subtracting a
4	counter-interference signal from said received signal to form a desired signal;
	a digital processor electrically coupled to said subtractor, said digital
	processor generating said interference reference feedforward signal from said
[] 	desired signal;
8	a correlator electrically coupled to said subtractor, said correlator comparing
9	said interference reference feedforward signal to said desired signal to generate an
10	error signal; and
11	

output, said first input is electrically coupled to said ADC;

5

7

12

13

error signal.

controller adaptively canceling interference on said received signal based on said

a satellite payload circuit comprising a first input, a second input, and an

said satellite payload circuit digitally processing said received signal to

	1	13. A communication system comprising:
	2	a first antenna for receiving a communication signal;
	3	an analog-to-digital converter (ADC) electrically coupled to said first
	4	antenna, said ADC converting said communication signal to a received signal;
	5	a subtractor electrically coupled to said ADC, said subtractor subtracting a
SUB	6	counter-interference signal from said received signal to form a desired signal;
47	> 7	a digital processor electrically coupled to said subtractor, said digital
4	8	processor generating said interference reference feedforward signal from said
Anna anna anna anna anna anna anna anna	9	desired signal;
A General A	10	a correlator electrically coupled to said subtractor, said correlator comparing
waren ete die gewen der	11	said interference reference feedforward signal to said desired signal to generate an
El	12	error signal; and
The second series and series series from the series	13	a controller electrically coupled to said correlator and said subtractor, said
	14	controller adaptively canceling interference on said received signal based on said
la b	15	error signal.